

LISTING OF CLAIMS:

1. (Previously presented) An obstacle detection device for a vehicle comprising:

radar means which radiates transmitted waves outside the vehicle and detects reflected waves of the transmitted waves;

sensing means which senses a distance to an obstacle around the vehicle based on a result of detection of the reflected waves by the radar means;

determining means which determines a limit distance within which the sensing means is capable of sensing, wherein the determining means determines the limit distance based on a result of detection of reflected waves whose signal level is lower than a preset signal level; and

judging means which compares the limit distance determined by the determining means with a preset sensing reference distance and thereby judges an operating state of the device,

wherein the sensing means includes signal level judging means which judges a signal level of the reflected waves.

2. (Original) The obstacle detection device according to Claim 1,

wherein the radar means radiates light waves and detects reflected waves of the radiated light waves,

wherein the signal level judging means judges a time width in which a voltage value corresponding to an intensity of light in the reflected waves is over a predetermined value, and

wherein the determining means determines the limit distance based on a result of detection of reflected waves whose time width is smaller than a preset reference time width.

3. (Original) The obstacle detection device according to Claim 2,

wherein the determining means presets as the reference time width a time width in which a voltage value corresponding to an intensity of light in given reflected waves sensed by the sensing means is over the predetermined value, wherein the given reflected waves are reflected by an obstacle positioned in proximity to the limit distance.

4. (Original) The obstacle detection device according to Claim 2,

wherein the sensing means recognizes a position of an obstacle as a segment formed of unified dots that gather adjacently, wherein the segment of unified dots are a subset of discontinuous dots that are obtained based on a result of detection of reflected waves, and

wherein the determining means determines the limit distance based on a result of detection of reflected waves of a given dot included in the segment, wherein the given dot has a time width in which the predetermined value is exceeded is largest among the dots included in the segment.

5. (Original) The obstacle detection device according to Claim 1,

wherein when the limit distance becomes less than the preset sensing reference distance, the judging means judges that the device's capability to detect distances has degraded.

6. (Original) The obstacle detection device according to Claim 1,

wherein, when the sensing means continuously senses a given obstacle for a predetermined time or longer after the sensing means senses the given obstacle for a first time, the determining means determines the limit distance based on a distance at which the sensing

means senses the given obstacle for the first time.

7. (Original) The obstacle detection device according to Claim 1,

wherein, when the sensing means continuously senses a certain obstacle for a predetermined time or longer and then becomes incapable of sensing the certain obstacle, the determining means determines the limit distance based on a distance at which the sensing means becomes incapable of sensing the certain obstacle.

8. (Currently amended) A method for detecting an obstacle around a vehicle, comprising the steps of:

~~radiating, from a radar,~~ transmitted waves outside the vehicle, the transmitted waves being radiated by a radar; and

~~detecting, in the radar,~~ reflected waves of the transmitted waves, the reflected waves being detected by the radar;

sensing a distance to an obstacle around the vehicle based on a result of detection of the reflected waves by the radar, including judging a signal level of the reflected waves;

determining a limit distance within which the distance ~~may be~~ sensed, wherein the determining step determines the limit distance based on a result of detection of reflected waves whose signal level is lower than a preset signal level; and

comparing the limit distance determined by the determining step with a preset sensing reference distance, and thereby ~~judging an operating state of the method~~ determining a capability to detect the obstacle.

9. (Previously presented) The obstacle detection method according to Claim

8,

wherein the transmitted waves are light waves,

wherein the signal level is judged by judging a time width in which a voltage value corresponding to an intensity of light in the reflected waves is over a predetermined value, and

wherein the limit distance is determined based on a result of detection of reflected waves whose time width is smaller than a preset reference time width.

10. (Previously presented) The obstacle detection method according to Claim

9,

further comprising presetting as the preset reference time width, a time width in which a voltage value corresponding to an intensity of light in given reflected waves is over the predetermined value, wherein the given reflected waves are reflected by an obstacle positioned in proximity to the limit distance.

11. (Previously presented) The obstacle detection method according to Claim

9,

wherein the sensing step includes recognizing a position of an obstacle as a segment formed of unified dots that gather adjacently, wherein the segment of unified dots are a subset of discontinuous dots that are obtained based on a result of detection of reflected waves, and

wherein the determining step determines the limit distance based on a result of detection of reflected waves of a given dot included in the segment, wherein the given dot has a time width in which the predetermined value is exceeded is largest among the dots included in the segment.

12. (Previously presented) The obstacle detection method according to Claim 8,

further comprising judging that the operating state has degraded when the limit distance becomes less than the preset sensing reference distance.

13. (Previously presented) The obstacle detection method according to Claim 8,

wherein, when the sensing step continuously senses a given obstacle for a predetermined time or longer after the sensing step senses the given obstacle for a first time, the determining step determines the limit distance based on a distance at which the sensing step senses the given obstacle for the first time.

14. (Previously presented) The obstacle detection method according to Claim 8,

wherein, when the sensing step continuously senses a certain obstacle for a predetermined time or longer and then becomes incapable of sensing the certain obstacle, the determining step determines the limit distance based on a distance at which the sensing step becomes incapable of sensing the certain obstacle.